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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/571,736

01/08/2007

Arno Willem F. Volker

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NORRIS, MCLAUGHLIN & MARCUS, P.A.  
875 THIRD AVE  
18TH FLOOR  
NEW YORK, NY 10022

EXAMINER

SAINT SURIN, JACQUES M

ART UNIT

PAPER NUMBER

2856

MAIL DATE

DELIVERY MODE

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PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/571,736	<b>Applicant(s)</b> VOLKER, ARNO WILLEM F.	
	<b>Examiner</b> J M. SAINT SURIN	<b>Art Unit</b> 2856	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 01/08/07, 03/14/06.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-15 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-15 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 14 March 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)            | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | Paper No(s)/Mail Date. _____                                      |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>03/06, 01/07</u> .  | 6) <input type="checkbox"/> Other: _____                          |

### **DETAILED ACTION**

1. The preliminary amendment of 03/14/06 is acknowledged, considered and entered.

#### ***Priority***

2. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

#### ***Drawings***

3. The drawings filed on 03/14/06 are accepted by the Examiner.

#### ***Claim Objections***

4. Claims 1 and 15 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claims 1 and 15 recite "at least one layer of a first material" and "at least one layer, adjacent to said first layer" in lines 2-3. The recitation of these layers without properly or clearly distinguish them make the claim confusing and unclear. In addition, the claims recite the limitation "said first layer" in line 3. There is insufficient antecedent basis for this limitation in the claim. Clarification and appropriate correction are required.

#### ***Claim Rejections - 35 USC § 103***

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the

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invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 1-8, 10-11 and 14-15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Taran et al. (US Patent 6,070,466) in view of Modderman et al. (US Patent 5,303,590)..

Regarding claims 1 and 15, Taran et al. discloses an acoustic testing apparatus (2) for testing a laminate material (4) comprising at least one layer (6) of a first material and at least one layer, adjacent to said first layer, of a second material, said acoustic testing apparatus comprising: a first transducer (18) for projecting an acoustic test signal onto a first layer (6) of said at least one layer of a first material disposed in a testing zone, characterised by: a second transducer (22) for receiving said test signal from said testing zone, and in that said first transducer (18 or 20) is adapted to project said test signal at an angle (col. 4, line 3) so as to generate in said first layer (6) vibrations of at least said first vibration mode (col. 4, lines 45-48), wherein said vibrations of said first vibration mode are incident on an interface with said layer of said second material under an incidence angle so as to produce in said second layer vibrations of at least said second vibration mode, so that refraction of said test signal at said interface is suppressed (col. 4, lines 48-65). However, Taran et al. does not particularly disclose or suggest first material having a first velocity for a first vibration mode and at least one layer, adjacent to said first layer, of a second material having a velocity for a second vibration mode, approximately equal to said first velocity. Modderman et al. discloses multi-layered structure is used for layered materials comprising layers of at least two materials having different acoustic properties, i.e.

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laminated structures, bonded structures, embedded layers etc. (col. 2, lines 42-46). It would have been obvious to one having ordinary skill in the art at the time of the invention to utilize in Taran et al. the techniques of Modderman et al. because variations in the thicknesses of the fibre layers (aramide, glass, etc.) lead to variations in the magnitude of the transmission coefficient in the transmission frequency bands relating to said fibre layers and generally, the more the acoustic properties of the different materials in a multi-layered structure differ one from another, the less the mutual influence on their specific acoustic transmission frequency bands will be. Thus, one of the ordinary skill in the art using the above combination would have known by frequency band selective analysis of the transmitted or reflected signals, influences on said signals due to variations in the layer parameters of a multi-layered structure under inspection, such as variations in the thickness of individual layers, can be adequately detected and/or eliminated in a reliable manner to make the above combination more effective.

Regarding claim 15, it is similar in scope with claim 1 and therefore, it is rejected for the reasons set forth for that claim.

Regarding claim 2, Taran et al. discloses an acoustic testing apparatus according to claim 1, wherein said first transducer is adapted to project said test signal at an angle so that said vibrations of said first vibration mode predominate in said first layer (col. 3, lines 34-42).

Regarding claim 3, Taran et al. discloses an acoustic testing apparatus according to claim 1, wherein said first transducer is adapted to project said test signal at an

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angle so as to suppress in said first layer the generation of vibrations of at least said second vibration mode (see Figs 1 and 2).

Regarding claim 4, Teran et al. discloses an acoustic testing apparatus according to claim 1 wherein said second transducer (22) is arranged to receiving said test signal reflected from said testing zone (col. 4, lines 36-48).

Regarding claim 5, Taran et al. discloses an acoustic testing apparatus according to claim 1, wherein said second transducer (22) is adapted to receive said reflected test signal at least one location (col. 4, lines 26-30).

Regarding claim 6, Taran et al. discloses an acoustic testing apparatus according to claim 1, wherein data associated with said laminate material is directly derivable as a function of time and position from said reflected test signal received by said second transducer (col. Lines 60-67).

Regarding claims 7- 8, Taran et al. discloses an acoustic testing apparatus according to claim 1, said vibrations of said first vibration mode are a shear wave and said vibrations of said second vibration mode are a compression wave, or vice versa (col. 4, lines 11-15).

Regarding claim 10, Taran et al. does not particularly disclose or suggest an acoustic testing apparatus according to claim 1, wherein the frequency of said test signal is in excess of the order of 20 MHz. Modderman et al. discloses a frequency range of 0.5 to 25 MHz is normally used for ultrasonic inspection (see: col. 7, lines 14-15). It would have been obvious to one having ordinary skill in the art at the time of the invention to utilize in Taran et al. a frequency of 20 MHz or in the range of 0.5 to 25

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MHz because one of the ordinary skill would have known that this frequency or frequency range is conventional, well known and commonly use in ultrasonic inspection.

Regarding claim 11, Taran discloses n acoustic testing apparatus according to claim 1, further comprising a plurality of second transducers (18, 20, 22) arranged in an array.

Regarding claim 14, Taran et al. discloses an acoustic testing apparatus according to claim 1, wherein said first transducer is disposed on a surface (10) of a solid element, wherein said surface is arranged so as to cause said first transducer to project said vibrations at said incidence angle (col. 4, lines 19-26).

7. Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over Taran et al. (US Patent 6,070,466) in view of Modderman et al. (US Patent 5, 303,590) and further in view of Silwa Jr. (US Patent 5,575,288).

Claim 9 differs from the prior art by reciting an angle of incidence between approximately 14 and 30 degrees. Silwa et al. discloses individual acoustic elements 130 of the multielement transducer 60 are oriented at 30 degrees to the hexagonal face of the material 66 that contains the mating flex interconnect traces 84, is preferred. It would have been obvious to one having ordinary skill in the art at the time of the invention to utilize in Taran in view on Modderman et al. the techniques of Silwa because by using the 30 degree orientation, the individual acoustic elements 130 in one half of the multielement transducer will intersect one face of the hexagonal attenuative backing material to make the above combination more effective.

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8. Claims 12- 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Taran et al. (US Patent 6,070,466) in view of Modderman et al. (US Patent 5, 303,590) and further in view of Cerofolini (US Patent 6,572,548).

Regarding claim 12-13, they differ from the prior art by reciting wherein said second transducers is/are arranged to be moveable to a plurality of locations for receiving said reflected test signal and wherein said second transducer is rotatably mounted on a support. Cerofolini discloses a member for supporting the transducer array which is mounted in such a manner as to swing about one of the two axes of the swing axles and which support is connected, through a mechanical drive to a first control motor, said support member, together with the transducer array (col. 22, lines 10-16). It would have been obvious to one having ordinary skill in the art at the time of the invention to utilize in Taran in view on Modderman the support of Cerofolini because it would provide a swinging about the axis in order to provide drive means to mechanically connect the support member to a control motor and allowing the transducer of being rotated in a reliable manner during inspection.

### ***Conclusion***

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to J M. SAINT SURIN whose telephone number is (571)272-2206. The examiner can normally be reached on Mondays to Fridays between 9:30 A.M and 6:00 P.M..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Hezron L. Williams can be reached on (571) 272-2208. The fax phone

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number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Jacques M SAINT SURIN/  
Examiner, Art Unit 2856